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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/322,067	05/27/1999	JEFFREY SKOLNICK	017886-0009-999	7470
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JONES DAY 222 EAST 41ST ST NEW YORK, NY 10017			EXAMINER BORIN, MICHAEL L	
			ART UNIT 1631	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/322,067	Applicant(s) SKOLNICK ET AL.	
	Examiner Michael Borin	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) 17,44-46,48-50,52,54,56,58,62-92,108 and 111-115 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,5-10,12-14,16,18-20,22,53,59,61,109 and 116 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 3,5-10,12-14,16-20,44-46,48-50,52-54,56,58,59,61-92,108,109 and 111-116.

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DETAILED ACTION

DETAILED ACTION

Abandonment issued on July 26, 2004 has been withdrawn on October 2010.

Status of Claims

Response to restriction requirement filed 09/08/2003 is acknowledged. Claims 3,5-10,12-14,16-20,22,44-46,48-50,52-54,56,58,59,61-92,108,109,111-116 are pending. Applicant elected Group I, claims 3,5-10,12-14,16,18-20,22, 53,59,61,109,116 without traverse. Claims 17,44-46,48-50,52,54,56,58,62-92,108,111-115 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected groups. Applicant's request to examine withdrawn claims if the claims directed to the elected group are found allowable is noted.

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Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 3,5-10,12-14,16,18-20,22, 53,61,109,116 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

With regard to claim 53 and claims dependent thereupon, a computer readable "medium" that comprises "instructions" as recited in claim 53 does not necessarily fall within any statutory class. A computer, properly equipped, can receive instructions via electronic data transmission over a wired network or over the air. However, a carrier wave or signal does not fall within any of the four categories of statutory subject matter, and is thus not statutory subject matter. *See In re Nuijten*, 500 F.3d at 1357. In the instant case, the specification specifically address signals as example of computer medium -see p. 79, 2nd full paragraph.

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With regard to claims 20,22 the claim are directed to a "library of descriptors" . The product as claimed is not a process, machine, manufacture, or composition of matter. "Functional descriptive material" consisting of data structures is nonstatutory when claimed as descriptive material per se.

Claim Rejections - 35 USC § 102 and 103.

Claims 3,5-8,10,12,18-20,53,59,61,116 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C.103(a) as obvious over Wallace et al.

The claims are drawn to a computer program product (and computer system containing said product) comprising a protein's functional site descriptor wherein the descriptor comprises

- identity of at least one amino acid residue;

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- geometric constraints between atoms of three or more amino acid residues, and
- variance for the geometric constraint

According to specification,

A "geometric constraint" refers to a spatial representation of an atom or group of atoms. Accordingly, such a constraint can be represented by coordinates in three dimensions, for example, as having a certain position, or range of positions, along x, y, and z coordinates (i.e., a "coordinate set"). Alternatively, a geometric constraint can be represented as a distance, or range of distances, between a particular atom (or group of atoms, etc.) and one or more other atoms (or groups of atoms, etc.). Geometric constraints can also be represented by various types of angles, including the angle of bonds (particularly covalent bonds, e.g., .phi. bonds and .psi. bonds) between atoms in an amino acid residue, between atoms in different amino acid residues, and between atoms in an amino acid residue of a protein and another molecule, e.g., a ligand, with ranges for each angle being preferred.

Wallace describes Ser-His-Asp functional site of proteinases and lipases by:

- identity of at least one amino acid residue. Ser,His,Asp are identified.
- geometric constraints between atoms of three or more amino acid residues. Table 3

teaches coordinates of the three residues of the functional site, thus providing geometric

constraints between at least three atoms of three residues. The distance can be measured

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between any atoms of the residues; however, the method works the best when the distance between Asp and Ser is defined by the distance between their functional oxygens.

See p. 1004, left column.

Further geometric constraints are reflected in the teaching that the residues are considered to be interacting when the distance between the atoms of the three residues is less than van der Waals radius plus 1A.

- variance for the geometric constraint. Wallace teaches that catalytic association between atoms of the residues occur at distance less than 2.0A, preferably 0.4-1.0A. p. 1066, left column.

The flow diagram of method of implementing calculations of 3D template is given on Fig. 1.

Further the method is applicable to, using applicant's terminology, "functional site descriptors" comprising not only the catalytic Ser-His-Asp triad but also atoms of different amino acid residues. See section "The catalytic tetrad" on pages 1007-1009.

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It is the Examiners position that all the elements of Applicant's invention with respect to the specified claims are instantly disclosed by the teaching of the reference cited above. It is noted that the Wallace reference, although using a computer database Protein Data Bank, does not specifically mention usage of a computer to implement the described method of searching structural databases. It is Examiner's position that the amount of data analyzed is such that it necessitates the use of a computer; therefore the method used in Wallace is regarded as a computer implemented method, and its result - as a computer program product.

However, should it appear unobvious that Wallace et al use a computer, it would have been *prima facie* obvious to one skilled in the art at the time the invention was made to implement method of Wallace using a computer to facilitate computation of huge amount of data. Providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art. "[t]he routine addition of modern electronics to an otherwise unpatentable invention typically creates a *prima facie* case of obviousness." In re Comiskey, 89 USPQ2d 1655 (Fed. Cir. 2009)

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Claims 53, 9,13,14,16,109 are rejected under 35 U.S.C.103(a) as unpatentable over Wallace et al.

for the reasons set for claims 3,5,7,8,10,12,18-20,53,59,61,116 above and further in view of the following.

With respect to claims 9,13,14,16,109, if there are any differences between Applicant's claimed method and that of the prior art, the differences would be appear minor in nature. Although the prior art do not teach the various combinations of geometric constraints, use of pseudoatoms, selection of proteins of particular functional activity, etc., the nature of the problem to be solved - adequately describing the structure of protein's functional site - would lead inventors to look at references relating to selection of possible factors known to facilitate description of polypeptide structure. One of ordinary skill in the art would have been motivated to combine all known factors with no change in their respective functions, and the combination would have yielded nothing more than predictable results of more comprehensive characterization of protein structure.

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Claims 3,5-10,12-14,16,18,53,59,61,109,116 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5561824 .

The claims are directed to machine readable storage medium comprising a program containing a set of executable instructions, and a corresponding computer system. The instructions comprise a "functional site descriptor" which is a non-functional descriptive material which does not impart functionality of instructions. There are no method steps that would require that said descriptive material effects the executable instructions or the computer medium they are on. It does not follow from the claim language that there is a new and unobvious functional relationship between the "descriptor" and the "instructions" or a substrate. Therefore, the characteristics of the "functional site descriptor" will not distinguish the claimed product from any prior art teaching a machine readable storage medium comprising a program containing a set of executable instructions.

US Patent No. 5561824 teaches a computer readable medium comprising a program containing a set of instructions comprising a descriptor. See claim 21.

All limitations concerning the type of data regarding the "site descriptor" are given no patentable weight as they are considered to be non-functional descriptive material. As such, the instant claim